Railroad Signaling Block Design Tool

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**Progress of current milestone**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Task | Completion % | Kenneth Truex | Christopher Diebold | Chad Mason | Zachary McHenry | To Do |
| Created Installer | 100% |  | 100% |  |  |  |
| Create project Success/Fail Scenarios | 100% | 25% | 25% | 25% | 25% |  |
| Draw track layout from Database | 80% |  |  | 80% |  | Display Track metadata |
| Simulate train moving on track | 0% |  |  |  |  | Scrubbed by GE |
| Display SBD for each segment | 100% | 100% |  |  |  |  |
| Highlight incorrect Track segments | 100% | 25% | 25% | 25% | 25% |  |
| Test Queries | 100% |  |  |  | 100% |  |
| Test User Forms | 90% |  |  | 100% |  | Create new Track Layout, add track segment |
| Test Calculations | 100% | 100% |  |  |  |  |
| Poster | 100% | 25% | 25% | 25% | 25% |  |

**Summary of Accomplished Tasks for Milestone 4**

Created Installer: GE has had problems running our executable program due to project dependencies. So to correct this we built an installer using windows forms to install all dependencies and create a shortcut on their desktop.

Create project Success/Fail Scenarios: We have been working with GE for a few weeks on how to determine the success or failure of the project. So the program has the following modules and success scenario:

* Database- Passes if the database connection can be open and closed, as well as all queries match the spreadsheet row results.
* Excel Parser- Data is correctly parsed and put in the database in the correct tables.
* Forms- a form passes if the fields in the form correctly throw an exception
* Algorithms- Based off of known good data provided by GE, the Safe braking distance is calculated and matches the GE data. Anything else is failure.
* GUI- All buttons respond and events are triggered properly.
* Renderer- Track layout if drawn from the database, and displays all track segments. If there are unsafe conditions the track segment is colored pink, else it should be blue.

Draw track layout from Database: This milestone is drawn using OpenTK, a C# port of OpenGL, and draws lines (track segments) based off of a coordinate defined in the GE sample data. If there are unsafe conditions that individual track segment is colored pink, else it is blue. We still need to display the track metadata for each track segment.

Simulate train moving on track: This milestone was scrubbed by GE halfway through the milestone.

Display SBD for each segment: This was accomplished in a previous milestone. In the previous milestone the calculation was performed from reading in GE sample data from an excel file. This was a proof of concept and was a way to verify that we had an understanding of how to replicate GE’s results. This milestone calculates a safe braking distance across a list of track segments and that data comes from the database. We also calculate the braking threshold value, so given a braking distance, we calculate the safe braking distance and how many feet a train needs to stop safely, which we call the braking threshold value.

Highlight incorrect Track segments: GE wanted us to come up with a way to signal to the user that upon calculating the safe braking conditions that there were unsafe conditions. We came up with a notification for each view. In the data view, the data is shown in a tabular format. We color the whole row pink, as a notification that there are unsafe conditions. In the Track layout view, any unsafe track segments are colored pink here as well.

Test Queries, user forms, and calculations: These components were tested using a combination of unit testing using NUnit, a C# port of Junit, and oracle testing using the GE sample data as our oracle.

Poster: We have created a poster for the end of term showcase.

**Summary of Contribution of Each Team Member**

Ken: For this milestone, I completed the Safe Braking Distance Algorithm from the database. I also helped with the algorithm for coloring the unsafe rows pink.

Chris: For this milestone, I created the installer as well as the testing. Using the test plan that we worked on with GE, we started testing for our success scenarios. I also helped color the unsafe rows red.

Chad: For this milestone, my focus was on drawing the track layout, the visual representation of the graph. One of the major obstacles was overcoming the performance glitches of OpenTK. I still need to overlay each track segment with metadata. I coded all the logic in the track layout to color unsafe track segments pink.

Zach: For this milestone, helped with algorithms making the unsafe row turn pink. I also contributed in the creation of the poster. I was in charge of testing the queries. Also, for this milestone I bounced around a lot and played a support role. I was also responsible for closing out some bug reports. The major bug I fixed was an exponential growth of our table rows every time you clicked a button. This was caused not in the database like we thought but a logic error on how we displayed the tabular data.

**Plan for Milestone 5**

* Finish user form testing
* Displaying track metadata
* Demo Video
* User Manual

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| --- | --- | --- | --- | --- |
| Task | Kenneth Truex | Christopher Diebold | Chad Mason | Zachary McHenry |
| User Form Testing |  | 100% |  |  |
| Demo Video | 25% | 25% | 25% | 25% |
| Display Track metadata | 75% |  | 100% |  |
| User Manual | 25% | 25% | 25% | 25% |

**Sponsor Feedback on Each Task for the Current Milestone**

Created Installer:

Create project Success/Fail Scenarios:

Draw track layout from Database:

Simulate train moving on track

Display SBD for each segment:

Display SBD for each segment:

Test Queries, user forms, and calculations:

Sponsor Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Sponsor Evaluation**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Kenneth Truex | 0 | 1 | 2 | 3 | 4 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 |
| Christopher Diebold | 0 | 1 | 2 | 3 | 4 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 |
| Zachary McHenry | 0 | 1 | 2 | 3 | 4 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 |
| Chad Mason | 0 | 1 | 2 | 3 | 4 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 |

Sponsor Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_